

Roll No.:

Test Date: 01-10-2017



**A I A T S**

ALL INDIA AAKASH TEST SERIES

*for* **MEDICAL**  
**Entrance Exams - 2018**

National Eligibility-cum-Entrance Test (NEET)

**TEST No.2**  
(XII Studying Students)

**INSTRUCTIONS FOR CANDIDATES**

1. Read each question carefully.
2. It is mandatory to use Blue/Black Ball Point Pen to darken the appropriate circle in the answer sheet.
3. Mark should be dark and should completely fill the circle.
4. Rough work must not be done on the answer sheet.
5. Do not use white-fluid or any other rubbing material on answer sheet. No change in the answer is allowed once marked.
6. Student cannot use log tables and calculators or any other material in the examination hall.
7. Before attempting the question paper, student should ensure that the test paper contains all pages and no page is missing.
8. Each correct answer carries four marks. One mark will be deducted for each incorrect answer from the total score.
9. Before handing over the answer sheet to the invigilator, candidate should check that PSID/User ID, Roll No. and Centre Code have been filled and marked correctly.
10. Immediately after the prescribed examination time is over, the answer sheet to be returned to the invigilator.

**Note :** It is compulsory to fill Roll No. and Test Booklet Code on answer sheet, otherwise your answer sheet will be rejected.



**Aakash**

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Time : 3 Hrs.

**TEST - 2**

MM : 720

**[ PHYSICS ]**

Choose the correct answer :

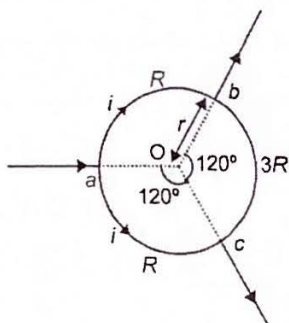
1. Which of the following statements is correct?

- (1) When magnetic flux linked with conducting loop is zero then emf induced is always zero  
 (2) When emf induced in conducting loop is zero, then magnetic flux linked with loop must be zero

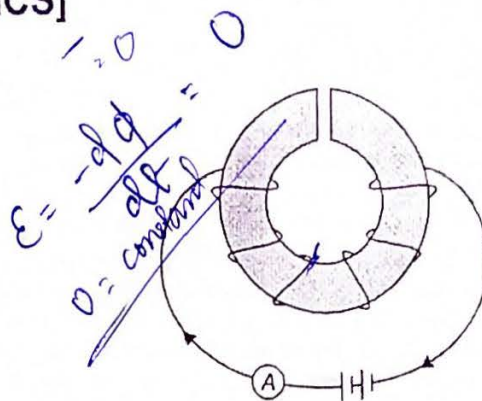
☒ (3) Transformer works on mutual induction

(4) All of these

2. The resistance of three parts of a circular loop is shown in the figure. The magnetic field at the centre O is



(1) Zero

(2)  $\frac{2\mu_0 i}{5r}$ (3)  $\frac{\mu_0 i}{6r}$ (4)  $\frac{\mu_0 i}{3r}$ 3. Consider an electromagnet as shown in figure. The magnetic material which is almost a toroid is wound with  $N$  turns each carrying a current  $I$ . Length of arc of magnetic material is  $L$  with an air gap of length  $\ell$ . Cross-section of toroid is  $A$ . Magnetic field intensity in air gap is ( $\ell \ll L$ )(1)  $\frac{1}{\mu_0}$  times the magnetic field intensity in the material(2)  $\mu_r$  times the magnetic field intensity in the material☒ (3) Same as that of the material

(4) Cannot be determined due to fringing of the field

4. If we consider earth's magnetism is due to short bar magnet placed at centre of earth, then the angle of dip  $\phi$  is related to magnetic latitude  $\lambda$  as  $\tan \phi = k \tan \lambda$ . Here the value of  $k$  is

(1) 2

(2) 0.5

(3) 1

(4) 0.25

5. The magnetic field at a point  $x$  on the axis of short magnet is equal to the field at a point  $y$  on the equatorial line of the same magnet. The ratio of distance of  $y$  and  $x$  from centre of magnet is(1)  $2^{-3}$ (2)  $2^3$ ☒ (3)  $2^{\frac{1}{3}}$ (4)  $2^{-\frac{1}{3}}$ 

Space for Rough Work

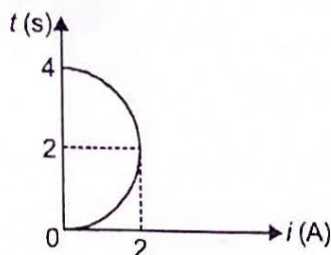
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(4) Both (1) & (2) are correct

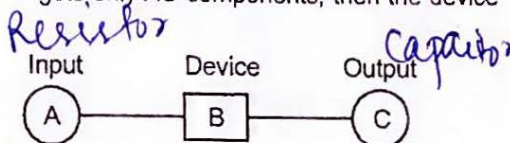
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14. The average value of current in  $i$ - $t$  graph of semicircular part is



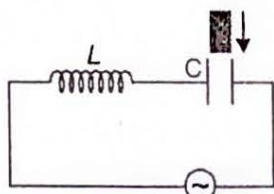
- (1)  $\frac{4}{\pi}$  (2)  $\frac{\pi}{\sqrt{2}}$   
(3)  $\frac{\pi}{6}$  (4)  $\frac{\pi}{2}$

15. If the input A contains both AC and DC and the output C gets only AC components, then the device B is



- (1) Capacitor  
(2) Inductor  
(3) Resistor  
(4) Both resistor and capacitor in series

16. The resonant frequency of  $L$ - $C$  circuit is  $f_0$  before insertion of dielectric of (dielectric constant)  $\epsilon_r = 4$ . After inserting the dielectric, the resonant frequency will be



- (1)  $\frac{f_0}{2}$  (2)  $4f_0$   
(3)  $2f_0$  (4)  $f_0$

17. When two AC generators of emf having peak voltage  $V_1$  and  $V_2$  and same frequency are connected in series, then the peak emf across A and B is



- (1)  $V_1 - V_2$  (2)  $V_1 + V_2$   
(3)  $\sqrt{V_1^2 + V_2^2}$  (4) Any of these

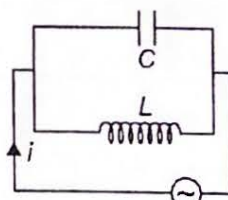
18. A choke coil of resistance  $R$  and inductance  $L$  is connected to an a.c. source of frequency  $\nu$  and peak voltage  $V_0$ . If angular frequency  $\omega$  will increase then, the average power dissipated in the choke

- (1) Will increase  
(2) Will decrease  
(3) Does not depend on  $\omega$   
(4) Cannot be determined

19. The dimensional formula of  $\epsilon_0 \frac{d\phi_E}{dt}$  is (where  $\phi_E$  is electric flux and  $\epsilon_0$  is permittivity of air)

- (1)  $[M^{-1}L^3T^{-2}A^{-1}]$   
(2)  $[M^{-1}L^2T^0A^{-1}]$   
(3)  $[M^0L^0T^0A]$   
(4)  $[M^0LT^0A^{-1}]$

20. An a.c. voltage of  $V = 100 \sin \omega t$  volt is connected across the parallel combination of inductor and capacitor having  $X_L = 5 \Omega$  and  $X_C = 10 \Omega$ , then current supplied by source is (in ampere)



- (1)  $-20 \cos \omega t$  (2)  $10 \cos \omega t$   
(3)  $10 \sin \omega t$  (4)  $-10 \cos \omega t$

Space for Rough Work

$$T/m^2$$

$$T \times$$

$$F = \epsilon_0$$

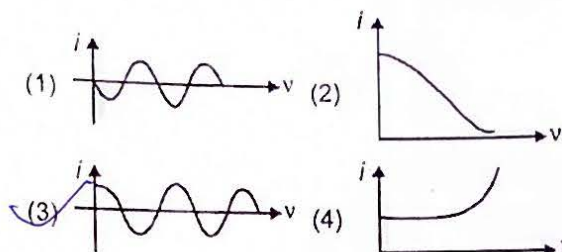
$$\text{Flux} = B \cdot A$$

$$= [ \text{A} ] [ L^2 ]$$

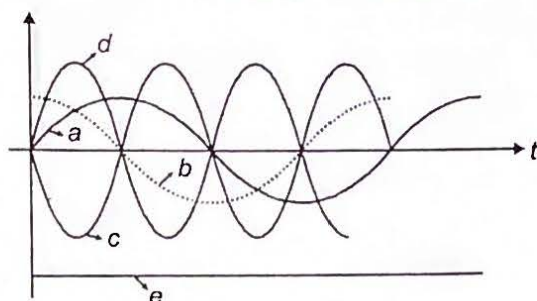




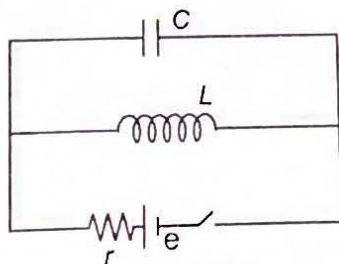
21. A series  $R$ - $L$  circuit is subjected to an alternating voltage given as  $v = v_0 \sin \omega t$ . Then the variation of peak current ( $i$ ) with frequency ( $\nu$ ) is denoted by



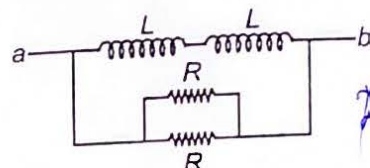
22. If an ac source is connected across ideal capacitor and current passing through it is denoted by curve (a) then instantaneous power is denoted by curve



- (1) c (2) b  
(3) e (4) d
23. A capacitor  $C$  and inductor  $L$  are connected in parallel with a battery of emf  $e$  and internal resistance  $r$ . At time  $t = 0$ , current through the cell be  $i_0$  and at  $t \rightarrow \infty$ , let the current be  $i$ . Then  $\frac{i_0}{i}$  is equal to

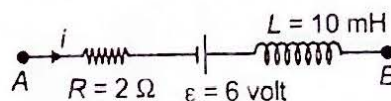


- (1) 1  
(2) Zero  
(3) Infinite  
(4) Cannot be determined
24. The time constant for  $L$ - $R$  circuit between the terminals  $a$  and  $b$  as shown in diagram is



- (1)  $\frac{4L}{R}$  (2)  $\frac{L}{R}$   
(3)  $\frac{L}{4R}$  (4)  $\frac{2L}{R}$

25. The network shown in the figure is a part of a complete circuit. If at a certain instant, the current  $i = 1$  A and potential at point A and B are equal, then the value of  $\left| \frac{di}{dt} \right|$  is

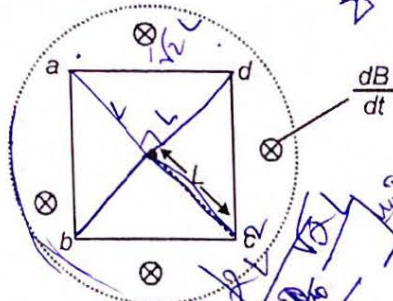


- (1) 400 A/s (2) 300 A/s  
(3) 800 A/s (4) 200 A/s
26. A uniform magnetic field along a long cylindrical rod varies with time as  $B = \alpha t$ , where  $\alpha$  is positive constant. The electric field inside the rod as a function of radial distance  $r$  from the central axis is proportional to

- (1)  $r^2$  (2)  $\frac{1}{r}$   
(3)  $\frac{1}{r^2}$  (4)  $r$

Space for Rough Work

27. A coil in the shape of square is placed in a variable magnetic field, which varies at the rate of  $\frac{dB}{dt}$  as shown in figure. The magnitude of emf between points a and d along path abcd will be



- (1)  $\frac{L^2}{2} \frac{dB}{dt}$  (2)  $L^2 \frac{dB}{dt}$   
(3)  $2L^2 \frac{dB}{dt}$  (4)  $3L^2 \frac{dB}{dt}$

28. A parallel plate capacitor made of circular plates each of radius 6 cm has a capacitance 100 pF. The capacitor is connected to a 230 V ac supply with a angular frequency of 300 rad/s. The amplitude of magnetic field at point 3 cm from the axis between the plates is

- (1)  $1.63 \times 10^{-11} \text{ T}$  (2)  $1.63 \times 10^{-8} \text{ T}$   
(3)  $3.26 \times 10^{-10} \text{ T}$  (4)  $2.30 \times 10^{-14} \text{ T}$

29. A short bar magnet of magnetic moment  $1.5 \text{ Am}^2$  is placed along x-axis at origin. If the magnetic field along line joining origin to point  $P(2\sqrt{3}, 2, 0) \text{ m}$  is

$\frac{\sqrt{n} \times 10^{-7}}{128} \text{ T}$ , then n should be

- (1) 3  
(2) 27  
(3) 9  
(4) 16

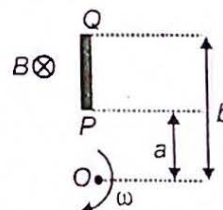
30. A bar magnet has a coercivity of  $4000 \text{ Am}^{-1}$ . It is desired to demagnetize by inserting it inside a solenoid 10 cm long and having 500 turns. The current which should be carried by solenoid is (Consider ideal solenoid)

- (1)  $0.8 \mu\text{A}$  (2)  $0.4 \mu\text{A}$   
(3)  $0.8 \text{ A}$  (4)  $\frac{0.8}{\mu_0} \text{ A}$

31. A magnet is suspended in the magnetic meridian with an untwisted wire. The upper end of wire is rotated through  $181^\circ$  to deflect magnet by  $37^\circ$  from magnetic meridian. Now this magnet is replaced by another magnet and upper end of wire has to be rotated by  $273^\circ$  to deflect magnet by  $53^\circ$  from magnetic meridian. The ratio of magnetic moment of the two magnets respectively is

- (1)  $\frac{3}{4}$  (2)  $\frac{48}{55}$   
(3)  $\frac{4}{3}$  (4)  $\frac{181}{273}$

32. A conducting rod PQ is rotated in a magnetic field B about an axis passing through point O as shown in figure. Then potential difference between P & Q is ( $\omega$  : angular speed)



- (1)  $B\omega(b^2 - a^2)$  (2)  $\frac{B\omega b^2}{2}$   
(3)  $\frac{B\omega a^2}{2}$  (4)  $\frac{B\omega}{2}(b^2 - a^2)$

Space for Rough Work

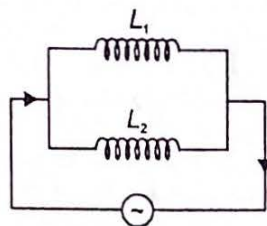
$C = \frac{A\epsilon_0}{d}$   
 $100 \times 10^{-6} = \frac{A \times 3 \times 10^{-2}}{d}$   
 $d = 5 \times 10^{-12} \text{ m}$   
 $r = 6 \text{ cm} \times 10^{-2}$   
 $C = 100 \times 10^{-6}$   
 $V = 230$   
 $\omega = 300$



33. A square loop of side 10 cm with its side parallel to x and y axis is kept in a uniform magnetic field pointing towards positive z-direction. If magnetic field changes at the rate of 0.1 T/s, then induced emf is

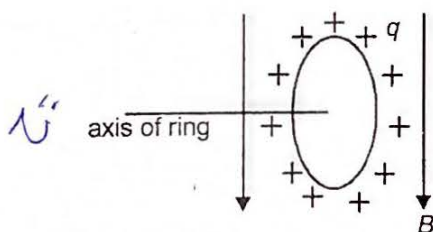
- (1) 1.0 mV (2) 0.5 mV  
(3) 1.5 mV (4) 0.3 mV

34. Two non-interacting inductor  $L_1 = 2$  mH and  $L_2 = 5$  mH are connected in parallel then respective ratio of



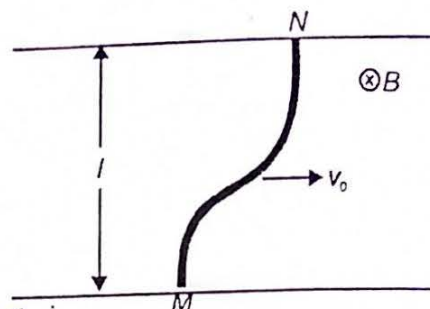
- (1) Flux is 1 : 1  
(2) Current is 5 : 4  
(3) Energy is 25 : 4  
(4) Energy is 4 : 25

35. As shown in figure there is a ring having radius  $R$  and charge  $q$  distributed uniformly over it. If ring is rotated with a constant angular velocity  $\omega$ , then torque acting on the ring due to magnetic force is (Assume that magnetic field  $B$  is parallel to plane of ring)



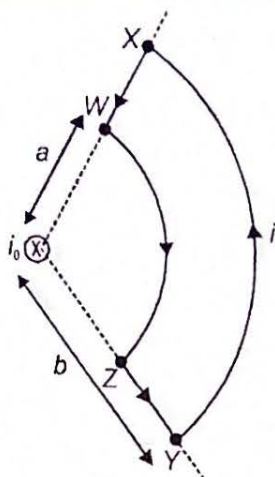
- (1)  $\frac{q\omega R^2 B}{2}$  (2)  $q\omega B R^2$   
(3)  $\frac{q\omega B R^2}{2\pi}$  (4) Zero

36. A conducting wire  $MN$  moves with velocity  $v_0$  along +x-axis in a uniform magnetic field  $\vec{B} = -B_0 \hat{k}$  as shown in the diagram, then



- (1) End N is positive and end M is negative  
(2) End M is positive and end N is negative  
(3) The emf induced along the rod does not depend on its shape, whether it is curved or straight  
(4) Both (1) & (3) are correct
37. An electron with mass  $m$ , velocity  $v$  and charge  $e$  describing half a revolution in a circle of radius  $r$  in a magnetic field  $B$ , will experience change in energy equal to
- (1)  $\frac{1}{4} mv^2$   
(2)  $\pi B r e v$   
(3)  $\frac{1}{8} mv^2$   
(4) Zero
38. A closed loop carrying current  $i$  is placed so that its plane is perpendicular to the long current carrying straight conductor as shown in the figure. The net force acting on the loop is [where WZ and XY are circular arcs]

Space for Rough Work



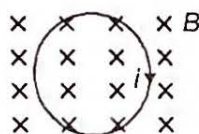
(1) Zero

(2)  $\frac{\mu_0 i i_0 (b-a)}{2\pi\sqrt{ab}}$

(3)  $\frac{\mu_0 i i_0}{\pi(a+b)} (b-a)$

(4)  $\frac{\mu_0 i i_0}{2\pi(a+b)} (b-a)$

39. A circular flexible current loop of radius  $R$  carrying current  $i$  is placed in an inward magnetic field  $B$ . If we spin the loop with angular speed  $\omega$ , then tension in string (Assume the mass of the loop is  $m$ )



(1) Is zero

(2) Is more than  $iBR$ (3) Is less than  $iBR$ 

(4) Does not depend on rotation

40. Electric field and magnetic field in a region of space are given by  $\vec{E} = E_0 \hat{j}$  and  $\vec{B} = B_0 \hat{j}$ . A charge particle is released at origin with velocity  $\vec{v} = v_0 \hat{k}$  then path of particle is

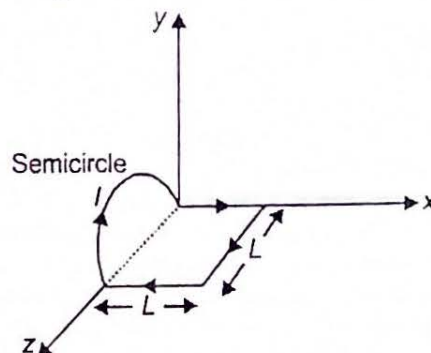
(1) Straight line

(2) Helical with uniform pitch

(3) Circular path

(4) Helical with increasing pitch

41. The magnetic dipole moment of current loop as shown in figure is



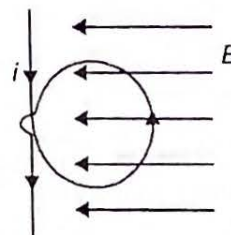
(1)  $-iL^2 \hat{j} - \frac{i\pi R^2}{8} \hat{i}$

(2)  $iL^2 \hat{j} + \frac{i\pi R^2}{8} \hat{i}$

(3)  $-iL^2 \hat{j} + \frac{i\pi R^2}{8} \hat{i}$

(4)  $-iL^2 \hat{j} + \frac{i\pi R^2}{4} \hat{i}$

42. As shown in diagram, a current carrying conductor is subjected to steady uniform magnetic field. Then

(1) Torque  $\tau = 0$ , force  $F = 0$ (2) Torque  $\tau \neq 0$ , force  $F \neq 0$ (3) Torque  $\tau = 0$ , force  $F \neq 0$ (4) Torque  $\tau \neq 0$ , force  $F = 0$ 

Space for Rough Work



43. In cyclotron, dees are perforated so that the stream of particles move in spiral path before emerging by the deflector. So, the angular momentum of an accelerating charge depends on radius  $r$  as

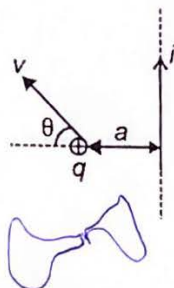
(1)  $r^2$

(2)  $r^{-1}$

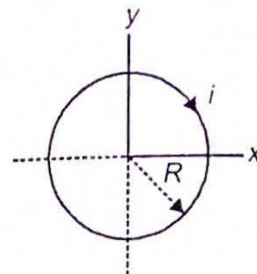
(3)  $r^0$

(4)  $r$

44. A charge particle of mass  $m$  and charge  $q$  is projected with velocity  $v$  along plane at a distance  $a$  from a long straight current carrying conductor as shown in figure. The radius of curvature of the path traced by the particle at the given position does not depend on



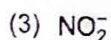
- (1) 0  
(2)  $q$   
(3)  $i$   
(4)  $m$
45. If a current carrying loop as shown in figure experiences a force  $\vec{F} = F_0 \hat{k}$ , (where  $F_0$  is positive constant) then nature of magnetic field should be



- (1) Uniform parallel to  $xy$ -plane  
(2) Uniform along positive  $z$ -direction  
(3) Uniform along negative  $z$ -direction  
(4) Radially outward and symmetric

## [ CHEMISTRY ]

46. Which of the following ligand exhibits highest 'Trans-effect'?



47. Which configuration exhibits strong 'Jahn-Teller' distortion in strong ligand field?



48. How many  $90^\circ$  ( $Co-O$ ) bond angles are possible in  $[Co(EDTA)]^{1-}$  complex?

(1) 5

(2) 4

(3) 3

(4) 6

49. Number of bond(s) between Mn atoms in  $[Mn_2(CO)_{10}]$  is/are

(1) 1

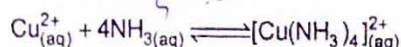
(2) Zero

(3) 3

(4) 4

Space for Rough Work

50. Overall formation constant of  $[\text{Cu}(\text{NH}_3)_4]^{2+}$  ion is found to be  $2.1 \times 10^{13}$  unit.



Overall instability constant for  $[\text{Cu}(\text{NH}_3)_4]^{2+}$  ion shall be

- (1)  $2.1 \times 10^{13}$  (2)  $7 \times 10^{13}$   
 (3)  $4.7 \times 10^{-14}$  (4)  $3 \times 10^{-16}$
51. Which is a  $\pi$ -acid ligand?  
 (1)  $\text{NH}_3$  (2)  $\text{CO}$   
 (3)  $\text{NO}_2^-$  (4)  $\text{H}_2\text{O}$
52. Correct statement is  
 (1)  $[\text{Zn}(\text{NH}_3)_4]^{2+}$  is tetrahedral and paramagnetic  
 (2)  $[\text{NiCl}_4]^{2-}$  is square planar and paramagnetic  
 (3)  $[\text{Zn}(\text{NH}_3)_4]^{2+}$  is square planar and diamagnetic  
 (4)  $[\text{Ni}(\text{CN})_4]^{2-}$  is square planar and diamagnetic
53. The most stable complex among following is  
 (1)  $[\text{Fe}(\text{CN})_6]^{3-}$  (2)  $[\text{Fe}(\text{NH}_3)_6]^{3+}$   
 (3)  $[\text{Co}(\text{NH}_3)_6]^{2+}$  (4)  $[\text{Ag}(\text{CN})_2]^-$
54. Correct order of spin only magnetic moment is  
 (1)  $[\text{Cr}(\text{NH}_3)_6]^{3+} > [\text{Fe}(\text{CN})_6]^{4-}$   
 (2)  $[\text{Cu}(\text{H}_2\text{O})_4]^{2+} > [\text{FeF}_6]^{4-}$   
 (3)  $[\text{Zn}(\text{NH}_3)_4]^{2+} > [\text{Cu}(\text{NH}_3)_4]^{2+}$   
 (4)  $[\text{Co}(\text{en})_3]^{3+} > [\text{Cr}(\text{NH}_3)_6]^{3+}$
55. The value of CFSE (Crystal field stabilisation energy) for  $\text{Na}_4[\text{FeF}_6]$  complex is (ignore pairing energy)  
 (1)  $-2.4 \Delta_0$   
 (2)  $-1.6 \Delta_0$   
 (3)  $-0.4 \Delta_0$   
 (4)  $-10.6 \Delta_0$

56. Correct order of crystal field splitting strength of ligands is

- (1)  $\text{NO}_3^- > \text{NO}_2^- > \text{NH}_3 > \text{CN}^-$   
 (2)  $\text{NO}_2^- > \text{NO}_3^- > \text{CN}^- > \text{NH}_3$   
 (3)  $\text{CN}^- > \text{NO}_3^- > \text{NH}_3 > \text{NO}_2^-$   
 (4)  $\text{CN}^- > \text{NO}_2^- > \text{NH}_3 > \text{NO}_3^-$

57. Which is outer orbital complex?

- (1)  $[\text{Cr}(\text{NH}_3)_6]\text{Cl}_3$  (2)  $\text{K}_4[\text{Fe}(\text{CN})_6]$   
 (3)  $[\text{Ni}(\text{NH}_3)_6]\text{SO}_4$  (4)  $[\text{Co}(\text{en})_3]\text{Cl}_3$

58. Total number of stereoisomers in  $[\text{Co}(\text{en})_2\text{Br}_2]^+$  complex are

- (1) 4 (2) 3  
 (3) 2 (4) 6

59. Effective atomic number of chromium in  $[\text{Cr}(\text{NH}_3)_6]\text{Cl}_3$  complex is

- (1) 36 (2) 35  
 (3) 34 (4) 33

60. 0.1 mole of  $\text{CrCl}_3 \cdot 4\text{NH}_3$  reacts with excess of  $\text{AgNO}_3$  solution then 0.1 mole of  $\text{AgCl}$  is precipitated out. How many chloride ions are coordinated with chromium ion?

- (1) 2 (2) 3  
 (3) 1 (4) Zero

61. Which of the following is a coordination compound?

- (1)  $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$   
 (2)  $(\text{NH}_4)_2\text{SO}_4 \cdot \text{FeSO}_4 \cdot 6\text{H}_2\text{O}$   
 (3)  $\text{KCl} \cdot \text{MgCl}_2 \cdot 6\text{H}_2\text{O}$   
 (4)  $\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$

62. Which is not a bidentate ligand?

- (1) Cyanido (2) Ethylene diamine  
 (3) Glycinato (4) Oxalato

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63. The lanthanide which do not exhibit +2 oxidation state is  
 (1) Lu (2) Eu  
 (3) Sm (4) Yb
64. Titration of  $\text{KMnO}_4$  in acidic medium is not satisfactory in presence of  
 (1)  $\text{H}_2\text{SO}_4$  (2)  $\text{HCl}$   
 (3)  $\text{HNO}_3$  (4) Both (2) & (3)
65. Which of the following does not have  $d\pi - p\pi$  bond?  
 (1)  $\text{NaClO}_3$  (2)  $\text{KAlO}_2$   
 (3)  $\text{SO}_3$  (4)  $\text{K}_2\text{Cr}_2\text{O}_7$
66. Potassium dichromate reacts with potassium iodide in acidic medium. What is oxidation state of product formed from reductant?  
 (1) +1 (2) Zero  
 (3) +3 (4) +5
67. Least acidic among following is  
 (1)  $\text{Cl}_2\text{O}_7$  (2)  $\text{Mn}_2\text{O}_7$   
 (3)  $\text{CrO}_3$  (4)  $\text{V}_2\text{O}_5$
68. Consider the following conversion  
 $\text{CrO}_4^{2-} \rightleftharpoons \text{Cr}_2\text{O}_7^{2-}$   
 Dominance of  $\text{Cr}_2\text{O}_7^{2-}$  and  $\text{CrO}_4^{2-}$  is observed in  
 (1) Basic and acidic medium respectively  
 (2) Acidic and basic medium respectively  
 (3) Acidic and neutral medium respectively  
 (4) Basic and neutral medium respectively
69. Which of the following carbide is not possible with Lanthanides (Ln)?  
 (1)  $\text{LnC}$  (2)  $\text{Ln}_3\text{C}$   
 (3)  $\text{Ln}_2\text{C}_3$  (4)  $\text{LnC}_2$
70. Which of the following exhibits only one type of lattice structure?  
 (1) Cr (2) Fe  
 (3) Ti (4) V
71. Choose the correct statement  
 (1)  $\text{Cr}^{2+}$  is weaker reducing agent than  $\text{Fe}^{2+}$   
 (2) Generally metal in metal fluorides exhibits higher oxidation state than in metal oxides  
 (3)  $E^\circ_{(\text{Mn}^{2+}/\text{Mn})}$  is more negative than  $E^\circ_{(\text{Cr}^{3+}/\text{Cr})}$  due to relatively high sublimation energy of Mn  
 (4) High negative  $E^\circ$  value for Zn owing to completely filled 3d subshell in  $\text{Zn}^{2+}$
72. Which of the following is most stable oxidation state of manganese?  
 (1) +2 (2) +3  
 (3) +4 (4) +6
73. Select the incorrect match.  
 (1) Highly electropositive – Smelting metals  
 (2) Noble metals – Cyanide process  
 (3) Less electropositive – Electrolytic extraction metals  
 (4) Both (1) & (3)
74. Ellingham diagram shows the change in free energy with temperature for oxides. Which is correct when curves of metals crosses each other?  
 (1)  $\Delta G = +ve$  (2)  $\Delta G = -ve$   
 (3)  $\Delta G = 0$  (4)  $\Delta H = +ve, \Delta S = -ve$
75. Which of the following can be extracted by thermite process?  
 (1) Iron  
 (2) Mercury  
 (3) Titanium  
 (4) Both (1) & (3)

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76. When impurity in metal can easily be oxidised than metal itself, then most suitable method for purification of metal is  
 (1) Poling (2) Cupellation  
 (3) Liquation (4) Zone refining
77. Which is not self reducing throughout the metallurgical process?  
 (1) ZnS (2) HgS  
 (3) Cu<sub>2</sub>S (4) PbS
78. Consider the following ores:  
 Haematite, Magnetite, Siderite, Iron pyrites.  
 How many of above ores can be concentrated by magnetic separation method?  
 (1) 2 (2) 1  
 (3) 4 (4) 3
79. Which is not an ore of copper?  
 (1) Cu(NO<sub>3</sub>)<sub>2</sub> (2) Cu<sub>2</sub>O  
 (3) Cu<sub>2</sub>S (4) CuFeS<sub>2</sub>
80. The compound which reacts with ozone to liberate oxygen is  
 (1) NO (2) CO<sub>2</sub>  
 (3) NO<sub>2</sub> (4) SO<sub>3</sub> 5 + O<sub>2</sub>
81. Which of the following compounds can be hydrolysed?  
 (1) SF<sub>6</sub> (2) CCl<sub>4</sub>  
 (3) SF<sub>4</sub> (4) NaCl
82. The hybridisation state of central atom of phosphonic acid is  
 (1) sp<sup>2</sup> (2) sp<sup>3</sup>  
 (3) sp (4) sp<sup>3</sup>d
83. Which element does not combine directly with nitrogen at high temperatures?  
 (1) Li (2) Rb  
 (3) Sr (4) Mg
84. Pick out incorrect statement  
 (1) PH<sub>3</sub> is more basic than AsH<sub>3</sub>  
 (2) Cl<sub>2</sub> disproportionates in hot and concentrated NaOH  
 (3) Bond angle of H<sub>2</sub>S is greater than H<sub>2</sub>O  
 (4) HOCl has more oxidising power than HClO<sub>4</sub>
85. Hydroxide of which compound is insoluble in aqueous ammonia solution?  
 (1) FeCl<sub>3</sub> (2) CuSO<sub>4</sub>  
 (3) AgCl (4) ZnSO<sub>4</sub>
86. Which of the following does not dimerise?  
 (1) NO<sub>2</sub> (2) ClO<sub>2</sub>  
 (3) ClO<sub>3</sub> (4) CuCl
87. Which of the following does not exist?  
 (1) XeO<sub>2</sub>F<sub>2</sub>  
 (2) XeO<sub>3</sub>  
 (3) XeF<sub>6</sub>  
 (4) XeF<sub>5</sub>
88. Select the incorrect statement.  
 (1) Ozone is diamagnetic 85  
 (2) KO<sub>2</sub> is paramagnetic O<sub>3</sub>  
 (3) BaO<sub>2</sub> is paramagnetic  
 (4) CaO is diamagnetic N≡N
89. How many lone pairs are present in N<sub>2</sub>O<sub>4</sub>?  
 (1) Six  
 (2) Eight N - N  
 (3) Ten  
 (4) Twelve
90. Which of the following is relatively least reactive?  
 (1) CO  
 (2) N<sub>2</sub>  
 (3) NO  
 (4) CN

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2CO<sub>2</sub>CO<sub>2</sub> + O<sub>3</sub>**Aakash**Medical | IIT-JEE | Foundations  
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## [ BIOLOGY ]

91. Which of the following induces fusion of protoplasts?
- Sodium chloride and potassium chloride
  - Polyethylene glycol and sodium nitrate
  - Pectinase and cellulase ✓
  - Cellulase and cutinase
92. *Methylophilus methylotrophus*
- Is a green alga
  - Is single cell protein
  - Is an unicellular fungus
  - Is a pathogenic, gram negative bacterium ✓
93. Match column-I (variety) with column-II (character) and select the set of correct match.
- | Column-I           | Column-II                    |
|--------------------|------------------------------|
| a. Sharbati Sonora | (i) Semi dwarf rice          |
| b. Protina         | (ii) Semi dwarf wheat        |
| c. Jaya            | (iii) Protein enriched maize |
| d. Atlas-66        | (iv) Protein enriched wheat  |
- (1) a(i), b(ii), c(iii), d(iv) (2) a(ii), b(i), c(iv), d(iii) ✓  
 (3) a(iii), b(iv), c(ii), d(i) (4) a(ii), b(iii), c(i), d(iv) ✓
94. M.S. Swaminathan
- Is famous for development of long duration low yielding varieties of rice
  - Is known for improving yield and quality of the crop without genetic improvement
  - Was against 'lab to land' programme
  - Is known as father of green revolution in India ✓
95. The final step in the tissue culture programme before the new plants are taken out for cultivation in the fields is known as
- Micropropagation ✓
  - Embryogenesis
  - Totipotency
  - Hardening
96. Plant breeding for improved food quality can perform
- Elimination of antinutritional factors
  - Enhancement of nutrient content
  - Elimination of higher protein and healthier fats
  - Both (1) & (2) ✓
97. Choose the **incorrect** match w.r.t. disease resistance
- | Variety              | Crop          |
|----------------------|---------------|
| (1) Pusa sadabahar ✓ | – Wheat       |
| (2) Pusa shubhra     | – Cauliflower |
| (3) Pusa swarnim     | – Brassica    |
| (4) Pusa komal ✓     | – Cowpea      |
98. Source of resistance genes for developing insect/pest resistant variety can be
- Cultivated varieties
  - Wild relatives
  - Germplasm collections of the crop
- (1) a & b only (2) b & c only  
 (3) a & c only ✓ (4) a, b & c
99. In mung bean, resistance to yellow mosaic virus and powdery mildew were
- Induced by mutations
  - Introduced by conventional breeding
  - Carried out by pure line selection
  - Both (1) & (3) ✓
100. 'Flocs' settled during aerobic digestion in STP include.
- Filaments of anaerobic bacteria
  - Filaments of fungi and anaerobic bacteria
  - Filaments of fungi and aerobic bacteria ✓
  - Filaments of anaerobic and aerobic bacteria ✓

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101. Read the following statements about activated sludge.

- It is the effluent passed from anaerobic digester to the settling tank.
- A small part of activated sludge is pumped into large tanks called anaerobic sludge digesters.
- A small part of activated sludge is pumped back into the aeration tank to serve as inoculum.

Which of the above statements are **incorrect**?

- a & c
- a & b
- b & c
- a, b & c

102. a. Bacteria are used in preparing idli, dosa and curdling of milk.

- Yeast is used in making only distilled alcoholic beverages.
- In biological treatment of waste water only aerobic bacteria are used

The number of **correct** and **incorrect** statements are

- |          |          |
|----------|----------|
| (1) 3, 0 | (2) 1, 2 |
| (3) 2, 1 | (4) 0, 3 |

103. Predator-prey relationships in biocontrol method is exemplified by all **except**

- Control of carrot grass by *Zygogramma*
- Control of cactus by cochineal insect in Australia
- Mosquito larva controlled by *Gambusia* fish
- Control of ball moth by *Bacillus thuringiensis*

104. Choose the **incorrect** match

- IARI – Indian Agricultural Research Institute
- GAP – Ganga Action Plan
- KVIC – Khadi and Village Industries Committee
- IPM – Integrated pest management

105. IPM involves methods

- To conserve beneficial insects
- Which are economically harmful but ecologically beneficial
- Having no impacts on plants, mammals, birds, fish or non target insects
- All except (2)

106. Choose the **incorrect** match

- |                          |                                   |
|--------------------------|-----------------------------------|
| (1) <i>Glomus</i>        | – Cyanobacteria                   |
| (2) <i>Devine</i>        | – First mycoherbicide             |
| (3) <i>Azospirillum</i>  | – N <sub>2</sub> -fixing bacteria |
| (4) <i>Streptococcus</i> | – Streptokinase                   |

107. Microbes as biocontrol agents are

- Always narrow spectrum like *Trichoderma*
- Always broad spectrum like NPV
- Either narrow or broad spectrum depending on their usage
- Pathogens affecting aerial parts of the crop only

108. Select the **incorrect** statements

- Indian agriculture accounts for approximately 62 percent of India's GDP.
- During the period 1960 and 2000, wheat and rice production increased from 11 million tonnes to 89.5 million tonnes
- Semi-dwarf rice varieties were derived from IR-8 and Taichung Native-1
- Saccharum officinarum* was originally grown in south india having high sugar content and yield

- a & c
- b, c & d
- Only d
- a, b & d

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5



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109. Choose the correct sequence of steps used in DNA fingerprinting.

- a. Blotting (2) b. Digestion (3)  
c. Hybridisation (1) d. Electrophoresis (5)  
e. Isolation (4) f. Autoradiography (6)

(1)  $e \rightarrow a \rightarrow c \rightarrow d \rightarrow b \rightarrow f$

(2)  $e \rightarrow b \rightarrow d \rightarrow a \rightarrow c \rightarrow f$

(3)  $e \rightarrow d \rightarrow a \rightarrow b \rightarrow f \rightarrow c$

(4)  $e \rightarrow a \rightarrow d \rightarrow b \rightarrow c \rightarrow f$

110. In floating gas holder type biogas plant

- (1) Digester tank is made 10 - 15 m deep inside soil  
(2) Gas holder rises as organic matter is consumed  
(3) Monomers formed after decomposition directly undergo methanogenesis  
(4) Naturally occurring bacteria in dung are not used

111. Read the following statements w.r.t. biological treatment of sewage.

- a. Involves removal of sewage through sequential filtration.  
b. BOD of waste water is directly proportional to its polluting potential.  
c. Constant agitation of primary effluent is carried out in large aeration tanks.

Identify the incorrect statement(s)

(1) b & c

(2) a & c

(3) Only a

(4) Only b

112. Full potential of Penicillin as an effective antibiotic was established by

(1) S.A. Waksman

(2) A. Fleming

(3) Ernest Chain & Howard Florey

(4) E. Jenner

113. The bioactive molecule used in detergent formulation as dirt buster is

(1) Cyclosporin-A

(2) Streptokinase

(3) Pectinase

(4) Lipase

114. How many of the following beverages are produced by distillation of the fermented broth?

Whisky, Wine, Rum, Brandy, Beer

(1) 4

(2) 3

(3) 2

(4) 1

115. Choose the correct statement w.r.t. human genome project

(1) More than 10 percent of genome codes for proteins

(2) The average gene consist of 30,000 bases, but size of gene rarely varies

(3) There are 1.4 million locations where SNPs occurs in humans

(4) Repetitive sequences of DNA do not shed any light on chromosome structure, dynamics and evolution

116. Read the following statements w.r.t. *lac* operon

a. *lac-i* is the constitutive gene.

b. *lac-y* codes for permease to increase permeability of cell to  $\beta$ -galactoside.

c. Lactose is the substrate for the enzyme  $\beta$ -galactosidase and it regulates switching on and off of the operon.

d. Regulation of *lac* operon can be also visualised as regulation of enzyme synthesis by its substrate.

The number of correct statements are

(1) 4

(2) 3

(3) 2

(4) 1

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117. What will be the number of ATP and GTPs respectively, required in polymerisation of 13 amino acids in protein biosynthesis?

- (1) 26, 26 (2) 13, 26  
(3) 13, 13 (4) 14, 28

118. In translation

- a. Site is cytoplasm whether a cell is eukaryotic or prokaryotic.  
b. Site is same as of transcription, in eukaryotic cell.  
c. Both enzymes and energy are involved.  
d. Site is same as of transcription, in prokaryotic cell.

Choose the set of correct statements

- (1) a, b, c (2) a, b, d  
(3) b, c, d (4) a, c, d

119. During transcription

- (1) More than 3 kinds of RNAPs are involved in synthesis of 3 kinds of RNAs in cytoplasm of prokaryotic cell  
(2) At least 3 kinds of RNAPs are involved in synthesis of 3 kinds of RNAs in cytoplasm of eukaryotic cell  
(3) 3 kinds of RNAPs are involved in synthesis of different types of RNAs in nucleus of eukaryotic cell  
(4) Only one kind of RNAP is involved in synthesis of 3 kinds of RNAs in nucleus of prokaryotic cell

120. Which of the following statements regarding transcription are correct?

- a. Transcription governs the principle of complementarity.  
b. If both strands of DNA act as a template, they would code for RNA molecule with same sequences.  
c. Double stranded RNA formed after transcription promotes RNA from being translated into protein.

d. Like the process of replication, the total DNA of an organism gets duplicated in transcription also.

- (1) b & c (2) d only  
(3) a only (4) a & c

121. During replication of DNA, nucleoside triphosphates serve as

- (1) Substrate only  
(2) Source of energy for polymerisation reaction only  
(3) Source of mutation and energy  
(4) Substrate and provide energy for polymerisation reaction

122. In eukaryotes the gene regulation could be exerted at four levels. Find the correct sequence of gene regulation

- a. Transport of mRNA from nucleus to the cytoplasm.  
b. Transcriptional level  
c. Processing level.  
d. Translational level

- (1) a → b → c → d (2) b → c → a → d  
(3) d → b → a → c (4) b → a → d → c

123. The nucleotide sequence AGGCCGAC can be verified as DNA or RNA segment on the basis of

- (1) Kind of N-bases  
(2) Type of pentose sugar  
(3) Presence of H-bonds  
(4) Number of nucleotides

124. RNA cannot act as genetic material as it

- (1) Can easily express the characters  
(2) Mutate at a faster rate  
(3) Can undergo replication  
(4) Is more stable chemically and structurally

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125. Considering DNA as genetic material, which is **not** a suitable feature?

- (1) It should be able to express itself in the form of 'Mendelian characters'
- (2) It should chemically and structurally be stable
- (3) It should provide the scope for frequent and rapid changes (mutation) that are required for evolution.
- (4) It should be able to generate its replica

126. In bacteriophage experiment, performed by Hershey and Chase, radioactivity in supernatant was due to

- (1)  $P^{32}$  in capsid of bacteriophage
- (2)  $S^{35}$  in nucleic acid of bacteriophage
- (3)  $S^{35}$  in capsid of bacteriophage
- (4)  $P^{35}$  in nucleic acid of bacteriophage

127. Match column-I (scientist) with column-II (contributions/work) and select the correct match.

Column-I	Column-II
a. F. Griffith	(i) <i>in-vitro</i> synthesis of DNA
b. Kornberg	(ii) Replication of DNA in faba beans
c. F. Miescher	(iii) Term 'Nuclein'
d. J.H. Taylor	(iv) Transformation principle

(1) a(iii), b(iv), c(ii), d(i)  
 (2) a(iv), b(i), c(iii), d(ii)  
 (3) a(iii), b(ii), c(i), d(iv)  
 (4) a(ii), b(i), c(iii), d(iv)

Handwritten notes:  $\mu p = 34^\circ$ ,  $34^\circ - 1$ ,  $0.4$ ,  $2.4 \times 10^{-9}$

128. The distance between two consecutive base pairs is  $0.34 \times 10^{-9}$  m, what will be the length of DNA double helix in a typical mammalian cell?

- (1) 0.34 nm  
(2)  $6.6 \times 10^9 \text{ bp} \times 0.34 \times 10^{-9} \text{ m/bp}$   $\rightarrow$   
(3) 22 m  
(4) 1.33 mm

129. In a DNA sample the proportion of A is 17%, the amount of G + T and C will be respectively.

- (1) 50% and 33%  
(2) 66% and 17%  
(3) 66% and 33%  
(4) 33% and 50%

130. Choose the set of **correct** statements for hydrogen bonding between complimentary bases of double helix structure of DNA.

- a. Responsible for parallel nature of the two DNA strands.
- b. Maintains stability of double helix.
- c. Generates approximately uniform distance between the two strands.

	a	b	c
(1)	T	T	T
(2)	F	T	T
(3)	T	F	T
(4)	T	T	F

131. Using Severo ochoa enzyme homopolymer of U and copolymer of CU are made consisting of 9 and 12 repeating units respectively. How many types and number of amino acids, these can polymerise during translation respectively?

- (1) 1, 3 and 1, 4                      (2) 2, 8 and 1, 3  
(3) 1, 3 and 2, 8                      (4) 1, 4 and 1, 3

132. Match Column-I and Column-II

Column-I	Column-II
a. Coding strand	(i) ρ factor
b. Template strand	(ii) intron
c. snRNAs	(iii) σ factor
d. Termination of transcription	(iv) 5' → 3' polarity
e. Initiation of transcription	(v) 3' → 5' polarity

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Choose the **correct** match

(1) a(iv), b(v), c(i), d(iii), e(ii)

(2) a(v), b(iv), c(ii), d(iii), e(i)

(3) a(iv), b(v), c(ii), d(i), e(iii)

(4) a(v), b(iv), c(iii), d(i), e(ii)

133. Segments of mRNA removed during splicing are

(1) Introns

(2) Exons

(3) Promotor regions

(4) Integrator regions

134. If the sequence of bases in template strand of DNA is ATTCGATG, then the sequence of bases in its transcript will be

(1) CAUCGAU

(2) GUAGCUUA

(3) UAAGCUAC

(4) AUUCGAUG

135. Transcription unit

(1) Starts with TATA box in prokaryotes

(2) Starts with palindromic region and ends with  $\rho$  factor

(3) Starts with promotor region and ends in terminator region

(4) Ends with CAAT region

136. Which of the following is responsible for dry scaly lesions on skin, nails and scalp?

(1) Roundworm

(2) Ringworm

(3) Pinworm

(4) Hookworm

137. Which one is **incorrect**?

(1) Rhino virus does not affect lungs

(2) Ebola virus can be transmitted through semen

(3) All the antibodies secreted by a stimulated B-cell have different variable region

(4) Diphtheria is a disorder of respiratory tract and the bacteria produces cytotoxin

138. Which of the following disease does not spread through droplet infection?

(1) AIDS

(2) Pertussis

(3) Common cold

(4) Diphtheria

139. Which is/are **correct** about Amoebiasis?

a. Caused by *Entamoeba histolytica*.

b. Stools with excess mucus and blood clots.

c. Life cycle is completed in human and housefly.

d. Transmission through faeco oral route.

(1) a, b & c

(2) b, c & d

(3) a, b & d

(4) a, c & d

140. Each of the following statements concerning malaria is correct **except**

(1) Early in infection, sporozoites enter the hepatocytes

(2) Parasites reproduce asexually in the red blood cells, bursting the red blood cells and causing cycles of fever and other symptoms

(3) Fertilization and development of parasite takes place in human red blood cells

(4) Cerebral malaria is the most serious one and can even be fatal

141. Which of the following is a collection of bacterial disease?

(1) Typhoid, Plague, Diphtheria

(2) Pneumonia, Chikungunya, Typhoid

(3) Malaria, Amoebiasis, Plague

(4) Dengue, Filariasis, Ascariasis

142. How many of the following diseases are non-infectious?

Measles, Cancer, Pertussis, T.B., Scurvy, Typhoid, Influenza, Plague, Malignant malaria

(1) Two

(2) Four

(3) Five

(4) Six

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Effluent - a, and c



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143. Which of these statements is/are correct w.r.t. MALT?

- a. Constitutes about 2/3rd part of the lymphoid tissue in human body.
- b. Associated with the mucus lining of digestive, respiratory and urogenital tracts.
- c. Site for interaction of lymphocytes with the antigen
- d. Cells like B and T lymphocytes migrate here after maturation. It is secondary lymphoid tissue

- (1) a, b & c (2) a & b  
(3) b, c & d (4) Only b

144. Match the type of antigen given in Column I with the example given in Column II of vaccine

## Column I

## Column II

- |                                                              |                             |
|--------------------------------------------------------------|-----------------------------|
| a. Live attenuated                                           | (i) Salk polio vaccine      |
| b. Killed microbes                                           | (ii) Tetanus vaccine        |
| c. Toxoid                                                    | (iii) Hepatitis 'B' vaccine |
| d. Antigenic polypeptides synthesised by genetic engineering | (iv) MMR vaccine            |

- (1) a(ii), b(iii), c(i), d(iv) (2) a(ii), b(i), c(iii), d(iv)  
(3) a(iv), b(i), c(ii), d(iii) (4) a(iv), b(ii), c(i), d(iii)

145. Antibody produced maximally during anamnestic response to antigen is

- (1) IgE (2) IgA  
(3) IgG (4) IgM

146. Which of the following is correctly matched?

## Immunity

## Example

- |                      |                                                                         |
|----------------------|-------------------------------------------------------------------------|
| (1) Active immunity  | - Antitoxin                                                             |
| (2) Passive immunity | - Inflammatory response                                                 |
| (3) Innate immunity  | - Graft rejection                                                       |
| (4) Active immunity  | - Infectious organism gaining access into body during natural infection |

147. Widal test is diagnostic test of

- (1) Typhoid (2) Ascariasis  
(3) Tuberculosis (4) Pneumonia

148. Colostrum secreted by the mother during initial days of lactation has abundant IgA antibodies to protect the infant. This is an example of

- (1) Artificially acquired passive immunity  
(2) Naturally acquired passive immunity  
(3) Artificially acquired active immunity  
(4) Naturally acquired active immunity

149.  $F_{ab}$  fragments of an antibody molecule are made up of

- (1) Variable regions of only the light chains at N-terminal end  
(2) Constant regions of only the heavy chains at C-terminal end  
(3) Variable regions of both heavy and light chains at N-terminal end  
(4) Constant regions of both heavy and light chains at C-terminal end

150. Mostly virus infected cells secrete proteins which protect the non-infected cells from further viral infection. The proteins secreted are

- (1) Antibodies (2) Interferons  
(3) Antibiotics (4) Antitoxins

151. Read the following points

- a. Cranial capacity about 900 c.c.
- b. Probably ate meat.
- c. First prehistoric man to make use of fire.

These points are true for

- (1) *Homo habilis*  
(2) *Homo erectus*  
(3) *Homo sapiens fossils*  
(4) *Homo sapiens neanderthalensis*

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152. Which of the following is the correct sequence of events in the origin of life?

- a. Reducing atmosphere.
- b. Origin of chemoautotrophs.
- c. Origin of genetic material.
- d. Origin of chemoheterotrophs.

- (1)  $a \rightarrow b \rightarrow c \rightarrow d$  (2)  $a \rightarrow c \rightarrow d \rightarrow b$   
 (3)  $b \rightarrow c \rightarrow a \rightarrow d$  (4)  $b \rightarrow c \rightarrow d \rightarrow a$

153. Which of these had the orthognathous face?

- (1) Java man
- (2) Peking man
- (3) Neanderthal man
- (4) Cro-Magnon man

154. Which of these was a fish-like reptile?

- (1) *Tyrannosaurus rex*
- (2) *Ichthyosaur*
- (3) *Pelycosaurus*
- (4) *Triceratops*

155. Arrange the following in the ascending order of evolution

- a. *Zosterophyllum*
- b. Herbaceous lycopods
- c. Tracheophyte ancestors
- d. Arborescent lycopods
- e. Chlorophyte ancestors

- (1) e, c, a, d, b (2) e, c, d, a, b  
 (3) e, a, d, b, c (4) e, d, a, c, b

156. Choose the **wrong** statement w.r.t. human evolution

- (1) *Homo sapiens* arose in Africa and moved across continents and developed into distinct races
- (2) Neanderthal man with a brain-size of 1400 cc lived in near East and Central Asia of a between 1,00,000 to 40,000 year back

(3) *Ramapithecus* and *Dryopithecus* were not hairy but walked like Gorillas and Chimpanzee

(4) Immediate ancestor of first human like hominid is *Australopithecines*

157. Which concept did Charles Darwin and Alfred wallace independently discover?

- (1) Mutation
- (2) Overbreeding
- (3) Sexual reproduction
- (4) Natural selection

158. Which of the following cannot results in changed frequency of genes and alleles in future generation?

- (1) Recombination during gametogenesis
- (2) Gene flow
- (3) Genetic drift
- (4) Acquired characters due to use and disuse of organs

159. The concept of chemical evolution is based on

- (1) Possible origin of life by combination of chemicals in presence of oxygen
- (2) Crystallization of chemicals under suitable environmental conditions
- (3) Possible origin of life by combination of chemicals in absence of oxygen
- (4) Effect of solar radiation on chemicals

160. A population can remain in genetic equilibrium for a longer time in the presence of

- (1) Selective mating in small isolated population
- (2) Nonselective interbreeding in large population
- (3) Selective mating in large population
- (4) Nonselective interbreeding in small isolated population

161. In a population of 400 individuals, frequency of recessive allele is 40%. Find out which of these represents the total number of individuals with dominant phenotype?

- (1) 144
- (2) 192
- (3) 256
- (4) 336

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Handwritten calculations for question 161:  
 $400 \times 0.4 = 160$   
 $400 - 160 = 240$   
 $240 \times 0.6 = 144$   
 Answer: 144





162. Find out the **incorrect** statement

- (1) Survival of fittest was expressed as natural selection by Darwin
- (2) Branching descent point towards common ancestry
- (3) *Hugo de Vries* proposed mutation theory on the basis of his work on evening primrose
- (4) According to Malthus food increases in geometrical progression

163. Which of the following is/are **incorrect** statements about the observation/work of Darwin and *Hugo de Vries*?

- (1) Charles Robert Darwin clearly and convincingly set forth the concept of natural selection as the mechanism of evolution, *de Vries* gave mutation theory
- (2) Darwin emphasised the adaptive nature of variation, *de Vries* stressed on its randomness
- (3) According to *Hugo de Vries* variations are small and directional, but Darwinian variations are random and directionless
- (4) Evolution for Darwin was gradual while *de Vries* believed mutation caused speciation and hence called it saltation

164. One of the important consequences of geographical isolation is

- (1) Inhibition of recombination during gametogenesis
- (2) No change in the isolated fauna
- (3) Increase in random mating
- (4) Speciation through reproductive isolation

165. From the given table showing convergent evolution between placental mammals and Australian marsupials, which is **incorrectly** matched?

	Placental Mammals	Australian Marsupials
(1)	Lemur	Spotted cuscus
(2)	Flying phalanger	Flying squirrel
(3)	Anteater	Numbat
(4)	Bobcat	Tasmanian tiger cat

166. Banded anteater, Bandicoot, Tasmanian wolf and Wombat differ from each other but they all inhabit the Australian island. This indicates that

- (1) They all have originated from a common marsupial ancestor
- (2) They show adaptive radiation
- (3) They all have analogous organs
- (4) Both (1) & (2)

167. Darwin finches are **not** an example of

- (1) Adaptive radiation
- (2) Adaptive convergence
- (3) Founders effect
- (4) A deviation from genetic equilibrium

168. Which of the following is **not** true statement?

- (1) Evolution is a stochastic process
- (2) Evolution is not a direct process in the sense of determinism
- (3) Evolution is always from simple form to complex form
- (4) Natural selection in which more individual acquire value other than the mean character value is called directional selection.

169. In England, before the industrialisation set in, it was observed that there were more white winged moths on the trees. However after industrialisation, there were more melanised moths in the same area. This is an example of

- (1) Evolution by anthropogenic action
- (2) Environmental pollution due to deposition of soot on the wings
- (3) Natural selection
- (4) Both (1) & (3)

170. There are two opposing views about origin of Modern Man. According to one view *Homo erectus* in Asia were the ancestor of modern man. A study based on mtDNA however suggested African origin of Modern man. The study of mtDNA is extremely

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useful for studying change overtime or to trace ancestor relationship among human lineages than nuclear DNA because

- a. mtDNA is inherited from only one parent.
- b. Meiosis and recombination do not occur in mtDNA.

c. mtDNA is inherited from two parents.

- (1) a only
- (2) b only
- (3) a & b only
- (4) a, b & c

171. Excess use of antibiotic has resulted in selection of resistant varieties of microbes.

Select the option that **does not** support this view.

- (1) This exemplifies directional selection
- (2) This suggests evolution by anthropogenic action
- (3) This represents a case of organic evolution
- (4) It supports theory of spontaneous generation

172. What was the most significant trend in the evolution of modern man (*Homo sapiens*) from his ancestors?

- (1) Increasing cranial capacity
- (2) Increase in height
- (3) Prognathous face
- (4) Development of language

173. Big-Bang theory attempts to explain

- (1) Origin of earth
- (2) Origin of universe
- (3) Both (1) & (2)
- (4) Organic evolution

174. In the serological test, if serum of human is mixed separately with the serum of ape, old world monkey, new world monkey and lemur, then the increasing order of degree of precipitation will be

- (1) Ape, new world monkey, old world monkey, lemur
- (2) Lemur, new world monkey, old world monkey, ape
- (3) New world monkey, old world monkey, ape, lemur
- (4) Ape, old world monkey, new world monkey, lemur

175. Following are the examples of some homologous and analogous organs

- (a) Tendrils of *Cucurbita* and thorn of *Bougainvillea*
- (b) Forelimbs of mammals.
- (c) Flipper of Penguin and Dolphin.
- (d) Wings of insects and wings of birds.

Choose the **correct** option.

**Homologous organs**

**Analogous organs**

- (1) (a) & (c)

- (b) & (d)

- (2) (a) & (b)

- (c) & (d)

- (3) (a) & (d)

- (b) & (c)

- (4) (c) & (d)

- (a) & (b)

176. Following are the two statements regarding the origins of life.

- a. The earliest organisms that appeared on the earth were cyanobacteria and presumably aerobes.
- b. The first autotrophic organisms were the chemoheterotrophs that released oxygen.

On the above statements which one of the following option is **correct**?

- (1) Both a & b are correct
- (2) a is correct but b is false
- (3) b is correct but a is false
- (4) Both a & b are false

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177. In 1938, a fish caught in South Africa happened to be a coelacanth which was thought to be extinct. These animal called lobe fins evolved into first
- (1) Vertebrates
  - (2) Gnathostomes
  - (3) Amphibians
  - (4) Chordate
178. The process of evolution of different species in a given geographical area starting from a point and literally radiating to the area of geography (habitats) is called
- (1) Adaptive radiation
  - (2) Convergent evolution
  - (3) Saltation
  - (4) Founder effect
179. Choose the **correct** statement
- a. Fitness has a genetic basis.
  - b. Fitness is the end result of the ability to adapt and get selected by nature.
  - c. The rate of appearance of new forms is not linked to the life cycle or lifespan of organisms.
  - d. According to Lamarck elongated neck of Giraffes is acquired character and passed to the succeeding generation.
- (1) a & b only                      (2) a, b & c only  
(3) a, b & d only                      (4) a, b, c & d
180. S.L. Miller in the famous simulation experiment obtained some amine group containing compounds. These molecules were
- (1) Amine sugars                      (2) Amine alcohols
  - (3) Amino acids                      (4) N-bases

□ □ □

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